

REMARKS

Claims 1, 26-38, 40, 41 and 45

Claims 1, 26-38, 40, 41 and 45 have been rejected under 35 USC 103(a) as being unpatentable over Sayles (US4952341) or Benziger (US4481371) in view of the article to Hench in further view of the article from Science and Technology review and in yet further view of AAPA.

Applicants respectfully assert that the rejection fails the *Graham* test.

The analysis of obviousness was set forth in *Graham v. John Deere*, 383 U.S. 1, 148 USPQ 459 (1966). In order to establish a *prima facie* case of obviousness, three basic criteria must be met:

First, there must be some *suggestion or motivation*, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the teachings of the references. Second, there must be a reasonable expectation of success. Finally, the prior art reference or combined references must teach or suggest *all the claim limitations*. *The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure (In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991; emphasis added).*

Applicants respectfully traverse the rejection as failing the *Graham* test. Specifically, the combination proposed in the rejection fails at least the first and third elements of the *Graham* test.

Regarding the first element of the *Graham* test, the law is clear: the teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure.

In the instant rejection, the Examiner relies on purported Applicant Admitted Prior Art (AAPA) to provide the motivation for the proposed combination of features. Particularly, the thrust of the motivation, as understood, is that since Applicants' disclosure states that the "composition of the

aerogels or xerogels is varied by the sol-gel processing, whereby various surface areas, densities, etc. can be produced”, one skilled in the art would have been motivated to use materials from other references with sol-gel processing to create the claimed invention.

Applicants respectfully challenge use of the present disclosure as motivation to combine features of any of the references. The law is clear: the teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. Here, the motivation is clearly based on Applicants' disclosure, in direct contravention of *Graham*.

Also regarding the first element of the *Graham* test, nor would the claimed invention have been predictable from the bare teachings of the prior art itself, or in knowledge generally known to those skilled in the art. The United States Supreme Court has acknowledged that there is no obviousness where the end result is unpredictable. In the recent case, *KSR International v. Teleflex Inc.*, 550 U.S. ___ (2007), the Court's analysis included by implication the traditional notion that evidence of unpredictable results is evidence of non-obviousness. Therefore, even though the Court made sweeping changes to the obviousness analysis, it acknowledged that a showing of unpredictable results could defeat an assertion of obviousness.

The courts have repeatedly stated that the chemical arts are, by their very nature, unpredictable. This case is no different. It is well within the chemical arts, and so is, by its very nature, unpredictable. Besides the inherent unpredictability recognized time and again by the courts, and as further proof of unpredictability, the present application also notes such unpredictability. Reference is made to p. 10, line 25 et seq., which describes how, in a preliminary proof of principle experiment, the presence of the gel structure dramatically decreased the impact sensitivity of an explosive. This result was counter to that expected.

For any of the foregoing reasons, the rejection of claims 1, 26-38, 40, 41 and 45 is improper as failing the first prong of the *Graham* test.

Claims 27-31 and 33-38 depend from claim 1, and therefore incorporate the limitations of claim 1. By virtue of their dependence, claims 27-31 and 33-38 are also believed to be allowable.

If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). Reconsideration and allowance of claims 27-31 and 33-38 is respectfully requested.

Additionally, regarding claim 27, the rejection fails the third prong of the *Graham* test. To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

The rejection fails to indicate where, if anywhere, the art of record teaches or suggests that materials are crystallized within pores of a sol-gel derived solid. For this reason as well, the claim is believed to be allowable.

Additionally, regarding claim 28, the rejection fails to indicate where, if anywhere, the art of record teaches or suggests solution exchange involving exchanging the liquid phase after gelation with another liquid containing an energetic material constituent, thereby allowing deposition of the energetic material constituent within the gel. For this reason as well, the claim is believed to be allowable.

Additionally, regarding claim 30, the rejection fails to indicate where, if anywhere, the art of record teaches or suggests utilizing reactive monomers which have functionalized sites dangling throughout the solid network after gelation, and controlling the number of functionalized sites while ensuring homogeneity at a molecular level. For this reason as well, the claim is believed to be allowable.

Additionally, regarding claim 31, the rejection fails to indicate where, if anywhere, the art of record teaches or suggests that sol-gel chemistry is carried out utilizing a methodology consisting of a functionalized energy network involving functionalizing energetic material constituent molecules so that they are reacted in solution to directly form a three-dimensional

solid (gel) which incorporates the energetic molecules at a finest scale

Additionally, regarding claim 33, the rejection fails to indicate where, if anywhere, the art of record teaches or suggests wherein the energetic material is uniformly distributed within pores of a solid network formed by the polymerization of the reactive monomer. For this reason as well, the claim is believed to be allowable.

Additionally, regarding claim 34, the rejection fails to indicate where, if anywhere, the art of record teaches or suggests after gelation, exchanging the liquid phase with another liquid which contains an energetic material constituent. For this reason as well, the claim is believed to be allowable.

Additionally, regarding claim 36, the rejection fails to indicate where, if anywhere, the art of record teaches or suggests utilizing reactive monomers which have functionalized sites dangling throughout the solid network, and dissolving an energetic material in mutually compatible solvents and diffusing into the gel which allows the energetic material to react and bind to the functionalized site. For this reason as well, the claim is believed to be allowable.

Regarding claim 32, Applicants respectfully assert that the rejection is improper. Particularly, claim 32 fails the third prong of the *Graham* test.

Claim 32 requires making solid energetic composite materials in which a skeletal structure and void spaces and the surrounding phase contains fuels, oxidizers, or other energetic composite materials.

In sharp contrast, the art of record fails to disclose or suggest solid energetic composite materials in which a skeletal structure and void spaces and the surrounding phase contains fuels, oxidizers, or other energetic composite materials. For example, Heinz discusses drying to remove all material from the pores. *See e.g.*, Heinz p. 36, col. 2 to p. 37, col. 1 (overview).

Similarly, the article from Science and Technology Review fails to disclose whether any material is present in the void spaces, much less fuels, oxidizers, or other energetic composite

materials.

For the foregoing reasons, the rejection fails the third element of the *Graham* test and must be withdrawn.

Claims 40 and 41 depend from claim 32, and therefore incorporate the limitations of claim 32. By virtue of their dependence, claims 40 and 41 are also believed to be allowable. Reconsideration and allowance of claims 40 and 41 is respectfully requested.

Additionally, regarding claim 40, the rejection fails to indicate where, if anywhere, the art of record teaches or suggests forming conductive gels which form the skeletal structure and void space, and utilizing the skeletal structure as substrates for the electrochemical precipitation of metal fuels. For this reason as well, the claim is believed to be allowable.

Additionally, regarding claim 41, the rejection fails to indicate where, if anywhere, the art of record teaches or suggests depositing metals with the skeletal structure and void spaces via decomposition from the liquid or gas phase of the process. For this reason as well, the claim is believed to be allowable.

Double Patenting

Claims 1, 26-38, 40, 41 and 45 have been rejected on the basis of double patenting. Submitted herewith is a terminal disclaimer, believed to obviate the double patenting rejection. Withdrawal of the rejection and allowance of all claims is respectfully requested.

Claims 1, 32 and 45

Claims 1, 32 and 45 have been rejected under 35 USC 102(b) as being anticipated by the article from Science and Technology Review.

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Moreover, the

identical invention must be shown in as complete detail as contained in the claim. *Richardson v. Suzuki Motor Co.* 868 F.2d 1226, 1236, 9USPQ2d 1913, 1920 (Fed. Cir. 1989). The elements must be arranged as required by the claim. *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990).

Claim 1 requires whereby producing a solid energetic material, wherein the energetic material includes a fuel and an oxidizer. In sharp contrast, the rejection cites air as the oxidizer. However, air is not a solid energetic material. Therefore, the rejection violates the rule of *Verdegaal Bros.* and *Richardson, supra*, and must be withdrawn.

Regarding claim 32, Applicants respectfully disagree that the article from Science and Technology Review discloses each and every limitation of the claim.

Claim 32 requires making solid energetic composite materials in which a skeletal structure and void spaces and the surrounding phase contains fuels, oxidizers, or other energetic composite materials. In sharp contrast, assuming *arguendo* that the article from Science and Technology Review discloses carbon as part of the solid structure and air in the voids, the article still fails to disclose whether any material is present in the void spaces, much less fuels, oxidizers, or other energetic composite materials. Therefore, the rejection violates the rule of *Verdegaal Bros.* and *Richardson, supra*, and must be withdrawn.

Claim 45 requires producing a solid energetic material comprising at least one of an explosive, a propellant, and a pyrotechnic. The rejection states that air and carbon function as propellants. However, air is not part of a solid energetic material. Therefore, the rejection violates the rule of *Verdegaal Bros.* and *Richardson, supra*, and must be withdrawn.

Conclusion

In the event that the Examiner finds any remaining impediment to the prompt allowance of these claims that could be clarified with a telephone conference, he or she is respectfully requested to initiate the same with the undersigned at 408-971-2573.

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Respectfully submitted,

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